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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/671,166	09/28/2000	Douglas B. Chrisey	NC No. 82,745	9098

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EXAMINER
MOORE, KARLA A

ART UNIT	PAPER NUMBER
1763	8

DATE MAILED: 06/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/671,166	CHRISEY ET AL.	
	Examiner	Art Unit	
	Karla Moore	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 May 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 September 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,292,559 to Joyce Jr. et al in view of U.S. Patent No. 3,787,210 to Roberts.

3. Joyce Jr. et al. disclose an apparatus for depositing a transfer material onto a receiving substrate in Figure 1, the apparatus comprising: a source of pulsed laser energy (16), a receiving substrate (14), a target substrate (10) wherein the front surface has a coating comprising a transfer material and a matrix material (12)l, means for positioning the source of pulsed laser energy (column 4, rows 7-31) in relation to the target substrate and means for positioning the receiving substrate in a spaced relation to the target substrate (column 3, rows 44-46). The coating of Joyce Jr. et al. comprises a matrix material (a polymer) and a transfer material (gold) to be deposited on a receiving substrate (column 2, rows 10-31).

4. With respect to claim 5, the transfer material is an electronic material, specifically, a metal (column 2, rows 27-32).

5. With respect to claim 8, which is drawn to an intended use, the court have ruled that inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims. In re Young, 75 F.2d 966, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).

6. With respect to claim 9, Joyce Jr. et al. teach the use of a polymer as the matrix material, which decomposes into volatile components when exposed to the source of pulsed laser energy (column 3, rows 18-27).

7. With respect to claim 14-15, the apparatus of Joyce Jr. et al. comprises means for moving the source of pulsed laser energy with respect to the target substrate and/or the receiving substrate (column 4, rows 17-27) and may also comprise a mask interposed between the source of laser energy and the target substrate (column 4, rows 9-11).

8. With respect to claims 17-18, Joyce Jr. et al. teaches a coating on the front surface of the target substrate with a total thickness within the claimed ranges of between about .1μm and about 100 μm and between 1μm and about 20 μm (column 5, rows 9-13).

9. Joyce Jr. et al. disclose the invention substantially as claimed and described above.

10. However, Joyce Jr. et al. fail to disclose the coating on the front surface of the target substrate is a mixture of the transfer material to be deposited and a matrix material, wherein the matrix material has the property of being or becoming more volatile than the transfer material when exposed to the source of pulsed laser energy.

11. Roberts discloses an apparatus for depositing a transfer material onto a receiving substrate in, Figure 1, comprising: a laser source (10), a receiving substrate (22) and a target substrate (18). The front surface of the target substrate has a coating that comprises a mixture of the transfer material to be deposited in the form of heat-absorbing particles dispersed in a self-oxidizing matrix material (nitrocellulose), wherein the matrix material has the property of being or becoming more volatile than the transfer material when exposed to laser energy for the purpose of utilizing to advantage the combustible characteristics of the matrix material in a coating to obtain higher resolution at increased speeds and at a reduced laser requirement (column 1, rows 48-62 and column 2, rows 16-21).

12. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to provide a coating that comprises a mixture of the transfer material to be deposited and a matrix material, wherein the matrix material has the property of being or becoming more volatile than the transfer material when exposed to laser energy in order to utilize to advantage the combustible characteristics of the matrix material in a coating thereby obtaining higher resolution at increased speeds and at a reduced laser requirement.

13. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joyce Jr. et al. and Roberts as applied to claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 above, and further in view of U.S. Patent No. 4,702,958 to Itoh et al.

14. Joyce Jr. et al. and Roberts disclose the invention substantially as claimed and described above.

15. However, the combined teachings fail to disclose the particle size of the transfer material.

16. Itoh et al. disclose an apparatus for depositing a transfer material onto a substrate, where the transfer material is in the form of particles having differing grain sizes of between 10nm and 20μm for the purpose of providing good adhesion of the resulting film on the receiving substrate (column 3, rows 11-16).

17. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a transfer material in the form of particles having differing grain sizes of between 10nm and 20μm in Joyce Jr. et al and Roberts, in order to provide a film on the receiving substrate with good adhesion as taught by Itoh et al.

18. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Joyce Jr. et al. and Roberts as applied to claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 above, and further in view of U.S. Patent No. 5,288,528 to Blanchet-Fincher.

19. Joyce Jr. et al. and Roberts disclose the invention substantially as claimed and described above.

20. However, the combined teachings fail to disclose the use of a polymer as the transfer material.

21. Blanchet-Fincher disclose an apparatus for depositing a transfer material onto a receiving substrate, wherein the transfer material is a polymer which is used for the purpose creating a film with antistatic, abrasion resistant or high resolution properties (column 1, rows 41-52).

22. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a polymer as the transfer material in the Joyce Jr. et al. and Roberts in order to create a film with antistatic, abrasion resistant or high resolution properties as taught by Blanchet-Fincher.

23. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Joyce Jr. et al. and Roberts as applied to claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 above, and further in view of U.S. Patent No. 6,165,247 to Kodas et al.

24. Joyce Jr. et al. and Roberts disclose the invention substantially as claimed and described above.

25. However, the combined teachings fail to teach the use of a transfer material which comprises metal of ceramic particles coated with an organic precursor.

26. Kodas et al. teaches the use of metal particles (platinum) used to form a thin film being coated with an organic precursor for the purpose of reducing corrosion of the particles and improving the dispersion characteristics of the particles (column 37, row 58 – column 38, row 6).

27. It would have been obvious to one of ordinary skill in the art at the time Applicant's invention was made to have used metal particles coated with an organic precursor as a transfer material in Joyce Jr. et al and Roberts in order to reduce corrosion of the particles and improve dispersion characteristics of the particles, as taught by Kodas et al.

28. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joyce Jr. et al. and Roberts as applied to claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 above, and further in view of U.S. Patent No. 4,987,006 to Williams et al.

29. Joyce Jr. et al. and Roberts disclose the invention substantially as claimed and described above.

30. However, the combined teachings fail to teach the use of an addition polymer as a matrix material.

31. Williams et al. teach the use of addition polymers, such as poly(a-methyl)styrene, as a matrix material for the purpose of taking advantage of it's highly absorbative nature, wherein the polymer will be heated and vaporized due to the pulsed laser energy resulting in a vapor blow-off (column 7, rows 25-33). Additionally, the use of a polymer as the matrix material serves to protect the transfer material (metal) and provides lateral strength during the violent transfer (column 3, rows 49-53).

32. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an addition polymer, such as poly(a-methyl)styrene, as the matrix material in

Joyce Jr. et al. and Roberts in order to take advantage of it's highly absorbative nature and to protect and provide lateral strength to the transfer material, as taught by Williams et al.

33. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Joyce Jr. et al. and Roberts as applied to claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 above, and further in view of U.S. Patent No. 5,135,870 to Williams (II) et al.

34. Joyce Jr. et al. and Roberts disclose the invention substantially as claimed and described above.

35. However, the combined teachings fail to teach the use of a matrix material selected from the group which includes water, aryl solvents, arene solvents, halogenated organic solvents, hydrocarbons, ketones, esters, ethers, carboxylic acids, phenols and phosphoric acid.

36. Williams (II) et al. disclose an apparatus for transferring a large molecule, such as a polymer, dispersed in a matrix material, where the matrix material (solvent), preferably water, is chosen based on volatility, solvent properties and vacuum compatability (column 3, rows 1-20). Other volatile (aryl) solvents such as benzene and toluene (column 7, rows 5-7) can also be used as matrix materials when transferring large molecules.

37. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a matrix material from the list above (especially, water, toluene or benzene) in Joyce Jr. et al. and Roberts for transferring a large molecule in order to take advantage of their volatility, solvent properties and vacuum compatibility, as taught by Williams (II) et al.

38. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Joyce Jr. et al. and Roberts as applied to claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 above, and further in view of U.S. Patent No. 5,401,616 to Isomi et al.

39. Joyce Jr. et al. and Roberts disclose the invention substantially as claimed and described above.

40. However, the combined teachings fail to teach the application of the transfer/matrix mixture by a coating method selected from the group consisting of spin coating, ink jet deposition, jet vapor deposition, spin spray coating, aerosol spray deposition, electrophoretic deposition, pulsed laser deposition, matrix assisted pulsed laser evaporation, thermal evaporation, sol gel deposition, chemical vapor deposition, sedimentation and screen printing.

41. Isomi et al. disclose a method and apparatus for depositing a transfer material contained in a mixture of the transfer material (organic pigments) and a matrix material (a resin), where the transfer material is transferred from the target substrate to the receiving substrate using pulsed laser evaporation and the mixture on the target substrate is formed by spin coating or other conventional methods in order to deposit the transfer material highly accurately and at low cost. Additionally, the deposition on the target layer can be inspected prior to transfer using this method, avoiding waste of a receiving substrate. (column 1, rows 49-67 and row 2, rows 27-40)

42. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an application of the transfer of material on the target substrate chosen from the list above and subsequently transferring the layer using pulsed laser evaporation in Joyce Jr. et al. and Roberts in order to obtain a method for depositing a transfer material highly accurately, at low cost and without wasting materials as taught by Isomi et al.

43. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Joyce Jr. et al. and Roberts as applied to claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 above, and further in view of U.S. Patent No. 5,814,165 to Tatah et al.

44. Joyce Jr. et al. and Roberts disclose the invention substantially as claimed and described above.

45. However, the combined teachings fail to disclose means to position the source of the pulsed laser with respect to the receiving substrate whereby the receiving substrate can be pretreated or whereby a transfer material deposited on the substrate can be annealed or etched.

46. Tatah et al teach the incorporation of a laser used for the annealing of metal lines (Figure 3) into an overall system (Figure 1) for depositing those metal lines such that separate equipment is unnecessary (column 5, rows 33-37), wherein the laser energy of the invention is positioned with respect to the receiving substrate using a computer (Figure 3, 8) and lens (Figure 3, 2).

47. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided means to position the source of the pulsed laser energy with respect to the receiving substrate in Joyce Jr. et al. and Roberts in order to eliminate unnecessary equipment, as taught by Tatah et al.

Response to Arguments

51. Applicant's arguments filed 05/06/03, with respect to the rejection under *35 USC § 103 (a)*, Joyce Jr. in view of Roberts, have been fully considered but they are not persuasive.

49. Applicant argues that the preferred energy densities of Joyce, Jr. et al. and the claimed invention, for performing an intended method using each of the apparatus differ, which is true. However, Examiner points out that while the preferred energy densities may differ, there are no structural differences between the prior art and the present Application. Therefore, the question becomes, "would the prior art be capable of the Applicant's intended method?", in other words, "would the pulsed laser energy source of the prior art be capable of supplying an energy density within the range of 0.05 to 7.5 J/cm^2?" In the instant case, the prior art would in fact be capable of supplying such an energy density. Joyce, Jr. et al. is an improvement patent, based on a process disclosed in U.S. Patent No. 4,987,006 to Williams et al., which is incorporated by reference (column 1, rows 4-11 of Joyce Jr. et al). Both Joyce Jr. and Williams et al. use an excimer laser as a source of pulsed laser energy and the laser is capable of supplying pulsed laser energy within an energy density range of 0.05 to 7.5 J/cm^2 (column 7, rows 34-37 of Williams et al). Again, the previously applied art continues to be applied against the presently claimed invention because the only differences are drawn to a method for using the apparatus, rather than the structure of the apparatus. The courts have ruled a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

50. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Roberts teaches providing a coating that

comprises a mixture of the transfer material to be deposited and a matrix material, wherein the matrix material has the property of being or becoming more volatile than the transfer material when exposed to laser energy in order to utilize to advantage the combustible characteristics of the matrix material in a coating thereby obtaining higher resolution at increased speeds and at a reduced laser requirement. Examiner also points out that Joyce Jr. does in fact teach placing the substrate in contact or in close proximity with the transfer material (column 2, rows 25-27). Applicant also argues that Joyce Jr. teaches against using a mixture of a transfer material and a matrix material. Examiner disagrees with this characterization. While Joyce Jr. teaches the use of layers of transfer material, nowhere in the reference does Joyce Jr. teach that the transfer material should not take any other form. Roberts provides motivation for combining the two apparatus, i.e. using a mixture of a transfer material and a matrix material. The motivation being taking full advantage of the combustible properties of a matrix material in the transfer process.

Conclusion

53. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km
June 1, 2003

P. Hassanzadeh
Primary Examiner
Art Unit 1763